

Regression Analysis

Last year, twelve randomly selected students took a mathematics aptitude test before they began their college mathematics course. Their results on the aptitude test and their final mark in the course are shown in the table. All scores are out of 100.

a) Make a scatter plot of the data and use linear regression to determine the equation of the line of best fit. Give the slope and vertical-intercept.

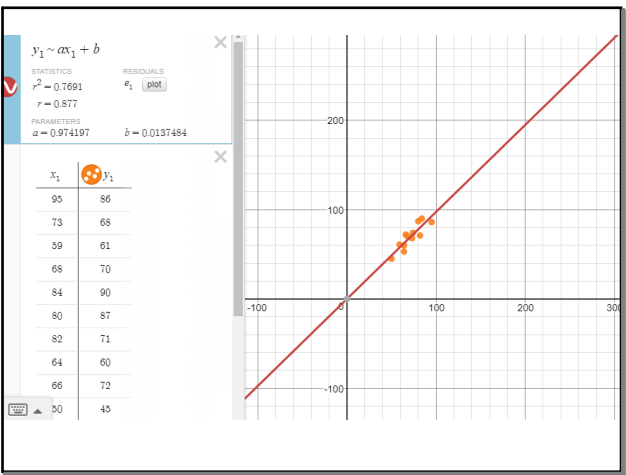
b) How well does the regression equation fit the data? Explain.

c) If Hannah scored 75 on the aptitude test, what would you expect her mark to be in her college mathematics course?

d) If Pietro scored 40 on the aptitude test, what would you expect his mark to be in his college mathematics course?

Student	Aptitude Test Score	Final Mathematics Mark
A	95	86
B	73	68
C	59	61
D	68	70
E	84	90
F	80	87
G	82	71
H	64	60
I	66	72
J	50	45
K	74	74
L	64	53

Apr 1-8:13 AM



Oct 19-10:09 AM

The table shows some average values of these three distances, in metres, for different speeds.

Speed (km/h)	Speed (m/s)	Reaction Distance (m)	Braking Distance (m)	Stopping Distance (m)
0	0.00	0.00	0.00	0.00
20	5.56	8.33	1.77	10.11
40	11.11	16.67	7.10	23.76
60	16.67	25.00	15.96	40.96
80	22.22	33.33	28.38	61.71
100	27.78	41.67	44.35	86.01

How does the relationship between speed and reaction distance compare with the relationship between speed and braking distance?

Desmos Equations

$y_1 \sim ax_1 + b$
 $y_1 \sim ax_1^2 + bx_1 + c$

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Time (h)	Bacteria Count
0	12
1	23
2	50
3	100

Height (m) | 0 | 15 | 20 | 20 | 15 | 0

5. The population of a bacteria colony is measured every hour and results in the data shown in the table at the left. Use difference tables to determine whether the number of bacteria, $n(t)$, is a linear or quadratic function of time. Explain.

Oct 19-8:30 AM

Steps to Graphing a Scatter Plot on the TI-83+.

STAT

1:Edit

Enter x values in L1 and y values in L2

STATPLOT (2nd, Y=)

1:Plot1

Highlight ON

WINDOW

Adjust values for the smallest and largest x-values (x-min, x-max), the smallest and largest y-values (y-min, y-max), and how many you want to count by on each axis (x-scl, y-scl).

GRAPH

Graphing a Line of Best Fit on the TI-83+.

In order to graph a line of best fit and measure the correlation strength, continue with the following steps after having already done the steps above:

MODE

Change from Float to 2 decimal places (by highlighting 2 and pressing ENTER)

2nd 0 (zero)

Cursor down the alphabetical catalogue until you get to "Diagnostics On", press ENTER twice

STAT

Cursor over to CALC

4:LinReg (ax + b)

2nd 1

comma (,)

2nd 2

comma (,)

VARS

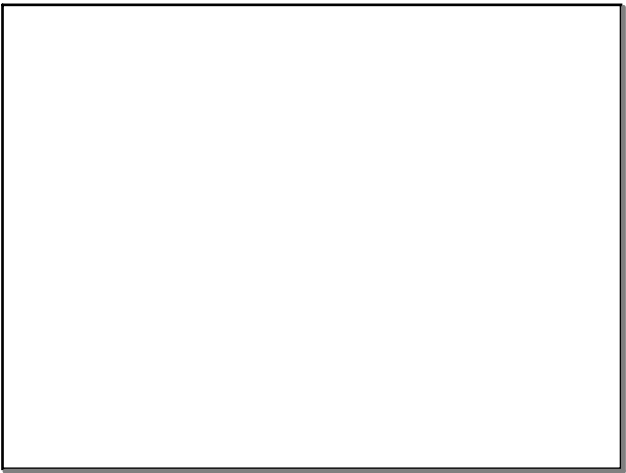
Cursor over to Y-VARS

1:Function

Y1

ENTER

Oct 19-8:00 AM



Oct 19-8:02 AM